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# The Commonwealth of Massachusetts
## Department of Personnel Administration
One Ashburton Place, Boston, MA 02108

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WILLIAM F. WELD
Governor

ROBERT C. DUMONT
Personnel Administrator

January 10, 1994

Dear Fire Fighter Candidate:

Thank you for your patience in waiting to be scheduled for the Physical Performance Test (PPT) for Fire Fighters. As you are probably aware, due to allegations that certain Fire Fighter candidates may have experienced medical problems resulting from the PPT, the Department of Personnel Administration suspended the administration of the test pending the completion of an investigation regarding the PPT by a nine-member expert panel of medical doctors and exercise physiologists. This panel found that the Physical Performance Test is an appropriate selection device, and recommended that it be resumed. **We have implemented the enhancements which were recommended by the expert panel in order to insure the maximum safety of the Fire Fighter candidates. We expect to resume testing within the next four to six weeks. The committee outlined several steps that should be taken to enhance pre-test medical screening procedures and ensure that candidates understand the importance of following the prescribed pre-test training program. It is extremely important that you closely follow the enclosed training instructions in order to minimize your risk of injury. It is also important that you complete the enclosed Preparedness Assessment Form and deliver or mail it by January 21, 1994, to the address stated on the form. Please make every effort to return the Preparedness Assessment Form by the due date to help facilitate the scheduling process.**

The panel of experts convened by the Department of Personnel Administration concluded that there is evidence that a small percentage (less than 1 percent) of participants have developed some degree of temporary muscle injury or kidney insufficiency, and that the most probable cause of such problems is due to an inadequate level of test-specific conditioning or some other predisposing factor(s) including advanced age, recent respiratory or influenza infection or higher than normal pulse rates or blood pressure. Intake, before or after the test, of certain types of prescription and over-the-counter medication, alcohol, drugs or steroids may also increase the risk of developing muscle or kidney related disorders.

We have no evidence indicating that any PPT participant suffered any permanent injury as a result of taking the test. If you have adequately trained and do not have any of the predisposing factors, the chances of developing medical problems as a result of taking the PPT are extremely remote. If you have any doubts about your condition to safely participate in and train for the PPT, you should see your physician. We also urge candidates who are pregnant to consult with their physicians. If you decide to visit a physician, please make sure to show your physician the enclosed training information, which includes a description of the events, so that the physician may fully assess your fitness for these specific test events.

While you are waiting for your notice to appear for testing, it is extremely important that you continue your training program as described in the enclosed Replacement Training Manual for the Fire Fighter Physical Performance Test dated January, 1994. For the purpose of insuring maximum safety, the attached manual **amends** the language contained in the Orientation and Preparation Guide which was made available in March of 1993, and the Additional Training Information for the Physical Performance Test which was mailed to you in September of 1993.

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The attached document amends the training regimen described in the previously available instructional material by including enhanced instructions for the Stairway Climb Event with particular emphasis on **the need to climb and descend actual stairs during training in order to minimize your risk of injury**. We ask you to pay close attention to the training information, particularly to that regarding the Stairway Climb Event.

Please note that the training instructions for the Stairway Climb Event call for you to gradually increase your speed climbing the stairs as you are training. Keep in mind that your score for this event will be based on how quickly you can carry the equipment **up** the stairs, so you should work on climbing the stairs as fast as is safely possible. During the actual test, for each trip down the stairs, you must descend the two flights of 15 stairs each within 30 seconds to avoid the assessment of penalty time. It will not help your score to take less than the allotted 30 seconds for the trips down the stairs. Therefore, there is no need, either while training or during the test, to descend the stairs at a pace faster than a brisk walk.

During the test, after you have carried the last piece of equipment up the stairs, you will have 6 minutes to carry the equipment down the stairs, one piece at a time. It will be in your best interest to use up as much of the 6 minutes as you can without going over the time limit. It will not help your score to return the equipment in less than 6 minutes.

You must not limit your training for the Stairway Climb Event by simulating climbing stairs using a stair climbing machine. Although the use of simulated stair climbing equipment will improve your aerobic fitness, this equipment does not fully prepare the muscles for descending stairs.

Because you will need to wear an air pack and harness weighing 22 pounds for the Stairway Climb Event, we recommend as the ideal training approach that you **gradually** work up to carrying a weight of 22 pounds in a back pack mounted on your shoulders.

You should also gradually work up to carrying up and down the stairs objects weighing 50 pounds, starting without weight and then gradually increasing the weight. As you build up the weight on your back and the weight you are carrying, you will need to take greater care to maintain a safe and moderate speed.

The enclosed Replacement Training Manual contains detailed instructions to help you train for the Stairway Climb Event in order to minimize your risk of injury. This newer document enhances and emphasizes certain parts of the previously available training material. **You are urged to read it and follow the given instructions**.

Remember, the job of Fire Fighter is rigorous and physically demanding and the Physical Performance Test is a reasonable measure of your fitness to perform the job.

Best of luck as you train for and take the Physical Performance Test.

Sincerely,

Robert C. Dumont
Personnel Administrator

enclosure

**PREPAREDNESS ASSESSMENT FORM**

**PLEASE COMPLETE AND RETURN TO THE ADDRESS BELOW NO LATER THAN JANUARY 21, 1994**

DEPARTMENT OF PERSONNEL ADMINISTRATION
ONE ASHBURTON PLACE
PUBLIC INFORMATION WINDOW, SECOND FLOOR MEZZANINE
BOSTON, MASSACHUSETTS 02108-1515
(617) 727-6215

The undersigned acknowledges the fact that I have received and read the Replacement Training Manual for the Fire Fighter Physical Performance Test with Enhanced Instructions for the Stairway Climb Event.

In addition, I declare that my state of preparedness to participate in this Test is best characterized by the following statement. (check only one)

_____ I have been training regularly for a minimum of sixteen (16) weeks using the training programs previously provided by DPA.

_____ I have been training regularly for _____ (fill in the blank) weeks using the training programs previously provided by DPA.

_____ I have completed no training at all.

_____
Applicant signature

_____
Social Security Number

_____
Date

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WILLIAM F. WELD
Governor

ROBERT C. DUMONT
Personnel Administrator

# The Commonwealth of Massachusetts
## Department of Personnel Administration
One Ashburton Place, Boston, MA 02108

**REPLACEMENT TRAINING MANUAL FOR THE FIRE FIGHTER PHYSICAL PERFORMANCE TEST (PPT)**

**WITH ENHANCED INSTRUCTIONS FOR THE STAIRWAY CLIMB EVENT TO INSURE MAXIMUM SAFETY**

January, 1994

This manual, which includes enhanced instructions for the Stairway Climb Event, **replaces** the information contained in the 1993 Entry Level Fire Fighter Examination Orientation and Preparation Guide (red booklet) which was made available in March, 1993, and the Additional Training Information for the Fire Fighter Physical Performance Test (PPT) which was mailed to you in September, 1993.

The six events comprising the PPT are described in the following pages as are suggested practical ways in which you can train and prepare for the PPT. If you follow this routine, at the end of your training, you should be in a reasonable position to compete in the PPT.

Please pay particular attention to the training tips given for the Stairway Climb Event. In order to be prepared for this event, you will need to train by climbing and descending actual stairs. As you begin your training, do not try to run at full speed; gradually increase your speed climbing the stairs. Remember that your test score will be based on how fast you can carry equipment **up** the stairs. The faster you go, the better your score will be. During the test, you must descend the two flights of 15 stairs each within 30 seconds to avoid the assessment of penalty time. It will not help your score to take less than 30 seconds for the trips down the stairs. **Therefore, there is no need, either while training or during the test, to descend the stairs at a pace faster than a brisk walk.** You must not limit your training for this event by simulating climbing stairs using a stair climbing machine. Although the use of simulated stair climbing equipment will improve your aerobic fitness and help condition the muscles used in climbing stairs, this equipment does not fully prepare the muscles for descending stairs. Because you will need to wear an air pack and harness weighing 22 pounds for the Stairway Climb Event, we recommend as the ideal training approach that you **gradually** work up to carrying a weight of 22 pounds in a back pack mounted on your shoulders. In addition, you should **gradually** work up to carrying up and down the stairs objects weighing 50 pounds, starting without weight and then **gradually** increasing the weight.

If you have any doubts about your condition to safely participate in and train for the PPT, you should see your physician. We also encourage candidates who are pregnant to consult with their physicians. If you visit your physician, please make sure to show your physician the enclosed training information so that the physician may fully assess your fitness for these specific test events.

**HELPFUL TIPS:**

* Remember, conditioning your body for vigorous physical exercise takes time....so give yourself at least 6 to 8 weeks to prepare adequately for the PPT.

* You should go through your training program 2 to 3 times per week for a minimum of 2 hours each session.

Events are listed in order of completion. For the first four events, you must wear an air pack and harness weighing 22 pounds. For the final two events, you must wear a safety helmet and knee pads which will be made available to you at the test site. You will not be allowed to wear your own helmet or knee pads.

1. **STAIRWAY CLIMB EVENT** - You will be required to carry pieces of fire equipment up (and down) 2 flights of 15 stairs each in 6 trips. The equipment weight varies up to a maximum of 50 pounds. During the test, you will not be scored on your trips down the stairs. You must descend the two flights of 15 stairs each within 30 seconds to avoid the assessment of penalty time. It will not help your score to take less than 30 seconds for the trips down the stairs.

* This event is of relatively long duration and will put demands on certain muscles and on your cardiovascular system. Fitness experts refer to this type of event as a measure of aerobic fitness, strength, muscular endurance, stamina, and cardiovascular endurance.

* Because you will be carrying items, some of which are heavy, up and down the stairs, a good level of muscular strength is also important. A graduated, test-specific weight program for the Stairway Climb Event appears below.

* Keeping a moderate but steady pace, begin by climbing and descending two flights of stairs (for example, from the first to the third floor). As you begin your training, do not try to run at full speed; gradually increase your speed climbing the stairs. Remember that your test score will be based on how fast you can carry equipment **up** the stairs. The faster you go, the better your score will be. During the actual test, you will not be scored on your trips down the stairs. You must descend the two flights of 15 stairs each within 30 seconds to avoid the assessment of penalty time. It will not help your score to take less than 30 seconds for the trips down the stairs. Therefore, **there is no need, either while training or during the test, to descend the stairs at a pace faster than a brisk walk.** Repeat as many times as you can without resting and count each round trip you as you go, keeping the same steady pace.

* For the first week of exercises, complete as many round trips as you did on the first day and record the amount of time you kept moving on the stairs. Increase the number of round trips by 1 per week, up to a maximum time of 10 minutes per session. Thereafter, try to gradually increase your speed up the stairs keeping your movement under control. Remember, there is no need to ever run down the stairs. Start your first week of training without carrying any weight. As your fitness for stair climbing improves, beginning with the second week of training, start carrying 10 pounds of weight as you go up and down the stairs. Gradually increase the additional weight by 10 pounds per week, working up to carrying a maximum of 50 pounds. This added weight could be in the form of hand-held weights or a dumbbell in each hand. To simulate the 22 pound air pack and harness worn during this event, gradually build up to carrying 22 pounds in a back pack strapped to your shoulders. Depending on your level of initial fitness, you may elect to start your training with no weight in your back pack.

* A good way to improve your aerobic fitness for this test event is to follow the "Stair Climb Program" and "Running Program" outlined on pages 19 and 20 of this Training Manual.

* The use of simulated stair climbing equipment will **not** condition your muscles for climbing and descending stairs, even though it is effective aerobic training and a very effective supplement to a running program. Therefore you must not limit your training for this event to the use of simulated stair climbing equipment. Gradually work up to the point where you can do 20 to 30 minutes of continuous stair-stepping exercise.

* Remember, stair climbing and descending is a demanding exercise. Aerobic fitness and proper muscle conditioning are crucial for success in this event.

2. **SLEDGEHAMMER EVENT** - Using an 8 pound sledgehammer, you will be required to strike a mounted rubber pad 15 times.

* Success in this event requires a good level of upper body muscular strength and speed of movement.

* Be sure to follow the weight training program outlined on pages 15 to 18 of the Training Manual.

* Additionally, an excellent and highly specific way to train for this event is to use an 8 pound sledgehammer which can be purchased at a hardware or lumber store.

* YOU CAN TRAIN BY ACTUALLY PERFORMING THE EVENT.

- Place some thick rubber padding around the trunk of a large tree or against a wall.
- Stand with your feet apart.
- Place your hands at the end and 2/3 of the way up the handle of the sledgehammer.
- Move the sledgehammer as fast as possible striking the rubber padding.
- Your backswing should go only past the mid-line of your body.

* Work up to the point where you can do 30 repetitions without stopping.

* Also, increase the number of sets of the exercise so you are eventually training with 5 sets of up to 20 to 30 repetitions.

* Remember, the speed with which you can safely complete this event is what's being evaluated; not the force with which you strike the rubber padding.

3. **LADDER EVENT** - You will raise and lower a fire ladder and weight on a pulley mechanism.

* A very practical way to train for the first portion of this event is simply to practice lifting from the ground to an overhead position an 8 or 10 foot aluminum ladder.

* This can also be simulated by lifting a 20 to 40 pound barbell from the ground position to directly overhead.

* Train for the event's second phase, the hand-over-hand rope pulley lift, by doing chin-ups and push-ups. These are described on page 13 of the Training Manual.

* You can also prepare the major muscles required for this event by doing the lateral pull-downs, arm curls, and upright rowing exercises described on pages 17 and 18 of the Training Manual.

4. **HOSE ADVANCE EVENT** - You will be required to drag a heavy fire hose 50 feet through an obstacle course.

* Successful performance of this event requires leg strength and power.

* Leg strength and power can be improved by doing 5 to 10 sets of 30 second rapid bursts of stair climbing or stair stepping.

* Leg strength can be developed by doing the "squats" exercise in the weight training program outlined on page 16 of the Training Manual.

* To specifically train for this event, fill a canvas bag or old suitcase with 50 pounds of sand or rocks or other heavy material. Attach to the bag a rope or canvas strap that can be placed over your shoulder and grabbed in front. Train by doing repeat bouts of dragging this resistance a distance of 50 to 100 feet.

* As you improve in this performance, you can increase the number of repetitions of the exercise as well as the distance the bag is dragged.

5. **SEARCH EVENT** - You will be required to crawl through an enclosed darkened area.

* Buy a pair of knee pads and practice crawling for 20 to 30 second periods. You can even crawl through a darkened space.

* Repeat this activity several times during your workout.

* Gradually attempt to increase the speed at which you crawl.

6. **RESCUE EVENT** - On your hands and knees, you will drag a 125 pound bag through a semi-enclosed covered course.

* The speed, strength, and power required for success in this event can be improved by following the weight training and strengthening program outlined in pages 15 through 18 of the Training Manual.

* A very specific and effective way to train for this event is to fill a canvas bag or old suitcase with 50 to 75 pounds of sand, rocks or other heavy material. Wearing knee pads, grasp this object firmly with one hand and, while crawling on hands and knees, drag it a distance of 25 feet, turn around and drag it back 25 feet. Rest several minutes and repeat. Repeat this sequence 6 times.

* Gradually increase the weight to 125 pounds. When you can drag this weight through the distance several times, you can increase both the weight and the distance dragged. This will provide additional training stimulus for this event.

## CHAPTER 1: WHAT IS THE PPT?

A Fire Fighter often performs risky and physically demanding duties under emergency conditions. A Fire Fighter's duties may include, for example: carrying fire equipment up and down flights of stairs; carrying, positioning, and climbing ladders; connecting, pulling and operating charged hose lines; crawling through dark areas; and dragging injured victims. Your overall physical fitness is very important to your effective performance as a Fire Fighter. The Physical Performance Test, or PPT, will test your physical ability to perform some of these duties.

A job analysis, or study of these duties, provides the basis of the PPT for Fire Fighter. The purpose of using job analysis information is to make the PPT as job-related as possible. The job analysis helped to identify six (6) separate types of duties, or events, that are essential to the performance of the job. These are the events included in the PPT.

PHYSICAL PERFORMANCE TEST (PPT) FOR FIRE FIGHTERS
BRIEF DESCRIPTION OF EVENTS

**You will be required to wear an air pack and harness weighing 22 pounds during the first four events.**

1. **STAIRWAY CLIMB:** This event tests your ability to carry and return pieces of fire equipment up and down stairs. You will carry equipment up two flights of 15 steps each in six trips. The equipment will range in weight up to a maximum of about 50 pounds. You will be scored only on the total time it takes you to go up the stairs. You will have a 30 second time limit for going down the stairs. It will not help your score to take less than 30 seconds for the trips down the stairs. Therefore, there is no need, either while training or during the test, to descend the stairs at a pace faster than a brisk walk.

   During the test, after you have carried the last piece of equipment up the stairs, you will have 6 minutes to carry the equipment down the stairs, one piece at a time. It will be in your best interest to use up as much of the 6 minutes as you can without going over the time limit. It will not help your score to return the equipment in less than 6 minutes.

2. **SLEDGEHAMMER EVENT:** This event simulates the way you would break through a door to gain entry into a burning structure. You will use an eight pound sledgehammer to strike a mounted rubber pad 15 times.

3. **LADDER EVENT:** This event tests your ability to use (e.g., raise and lower) fire ladders. First, you will remove and replace a small ladder, and secondly, you will raise and lower a 30-pound weight using a rope and pulley.

4. **HOSE ADVANCE:** This event requires you to advance heavy fire hose about 50 feet through a marked course with obstacles.

**You will be required to wear a safety helmet and knee pads (to be provided at the test site) during the final two events.**

5. **SEARCH EVENT:** This event requires you to crawl through an enclosed darkened area.

6. **RESCUE EVENT:** This event tests your ability to drag an unconscious victim from a burning area or other emergency scene. You must drag a 125 pound sandbag about 50 feet through a semi-enclosed, covered course.

Performance on the six PPT events will depend on how you measure up in four categories of fitness: cardiovascular fitness, muscle strength, muscular endurance, and flexibility. This Training Manual describes a program of exercises you can use to improve your ability in each of these fitness categories, as well as some health-related suggestions you can use to improve your general fitness.

The PPT is strenuous, so you should try to get into good physical shape over the next weeks. The ideal fitness program described in this Training Manual takes 16 weeks. A longer training period certainly cannot hurt. Depending on your current level of fitness, a shorter training period may be enough. In any event, you should experience significantly positive training benefits after six to eight weeks of following the prescribed training program. You must make your own estimate as to how much time you will need to give to training. A shorter physical training program often will not be enough.

Chapters 2 and 3 discuss some important health factors and provide general information about physical training and fitness. Chapters 4 through 9 give general directions and the specific exercises which make up the fitness program, including warm-up and flexibility exercises, calisthenics or weight training, stair climb training, running, and a cool-down phase. Also, important words are explained. Chapter 10 lists some books on exercise which you may read if you are interested. The books are not required for the examination. Chapters 11 and 12 have two sample weekly log sheets to help you keep track of your progress, depending on the fitness program you choose for training.

You know whether your physical condition puts you at the level of beginner, intermediate or advanced. The exercise programs which are presented below are useful for many people, but you should choose exercises to match your body and your state of fitness.

The fitness program is designed to be followed at or near home. If instructions and normal precautions are followed, it can be done without constant supervision by a trained fitness specialist. If you have any doubt about an exercise, you should check with a trained specialist or physician.

## CHAPTER 2: HEALTH FACTORS

### Medical Condition

Before beginning the fitness program, you should ask yourself the following questions:

1. Has your doctor ever said you have heart trouble?
2. Do you often have pains in your chest?
3. Do you often feel faint or have spells of severe dizziness?
4. Has your doctor ever told you that you have a bone or joint problem, such as arthritis, that has been aggravated by exercise, or might be made worse with exercise?
5. Is there any other reason why you should **not** exercise vigorously even if you wanted to?
6. Are you pregnant?
7. Do you have high blood pressure?
8. Do you have an abnormally high pulse rate?
9. Are you overweight?
10. Do you have diabetes?

If the answer to any of these questions is yes, then you should check with your physician before beginning this training program. You should also check with your physician before starting this training program if you have any questions or uncertainties about your medical or physical condition. If you decide to visit a physician, please show your physician this Training Manual with event descriptions to allow an assessment of your fitness for the PPT.

## Smoking

You must be a non-smoker at the time of and after appointment as a Fire Fighter. If you currently smoke, it would be a good idea to quit smoking as you begin your physical training.

## Weight Control

Carrying extra weight in the form of fat will hurt your performance on the PPT. Extra weight increases the work that muscles have to do when performing a task. For example, when an overweight person walks up stairs, the leg muscles have to lift more weight and therefore have to work harder than if the person weighed less. As a result of lifting more weight, the muscles get tired more quickly and are not able to maintain the activity for as long as may be necessary. This will hurt an overweight person's test performance.

Overweight candidates should try to lose weight before taking part in the PPT. If you are overweight, you should start trying to lose weight as soon as possible in a gradual, healthy manner, and not with a drastic diet. Following this fitness program will help you lose weight even if you do not diet but simply maintain the same food intake.

It is important that any person who is trying to lose weight eat a well-balanced diet that includes enough carbohydrates, proteins, and fats. To achieve this balance, you should eat, on a daily basis, foods from the four basic food groups such as those listed below:

1. Two servings of meat, fish, or poultry (1 serving = 3 oz).
2. Two servings of nonfat or low-fat milk, or milk substitutes (1 serving = 1 cup).
3. Four servings of fruits or vegetables (1 serving = 1/2 - 3/4 cup).
4. Four servings of breads or cereals (1 serving = 1/2 - 3/4 cup or 1 slice).

Some common sources of carbohydrates, proteins, and fats are listed in the following table.

| Type of Food | Common Sources |
|---|---|
| Carbohydrate (starches) | Potatoes, beans, peas, grains, flour, macaroni, noodles, bread, cereals |
| Carbohydrate (sugars) | Candy, cookies, cakes, jelly, sugar, honey, nuts |
| Protein | Meat, fish, poultry, eggs, milk, nuts, beans, peas |
| Fats (saturated) | Butter, animal fats, red meat, ice cream, cheese, milk, chocolate, mayonnaise, egg yolk |
| Fats (unsaturated) | Vegetable oil, low-fat cheese, skim milk, margarine, nuts |

If you are trying to lose weight, most of the carbohydrate content of your diet should come from the starch group because foods in this group are lower in calories than foods in the sugar group. The fat content should come from the unsaturated group and protein should come mainly from fish and poultry.

Many people eat too many of their fats from foods that contain saturated fats such as red meat, ice cream, and butter. Eating saturated fats may contribute to the development of heart disease, so it is recommended that most of a diet's fat content come from the unsaturated group. In fact, an easy way for you to cut down on your fat intake is to simply avoid foods that are high in saturated fats, such as red meat.

Just reducing your fat intake can lead to weight reduction. For more information about diets or for more detailed suggestions about meal contents, a dietician or physician should be consulted.

There are many inaccurate ideas about diets. Some of the most common mistaken beliefs are discussed below:

1. Exercise does not stimulate appetite. In fact, at times, it makes you less hungry.
2. In order to maintain proper body fluid levels, water intake must not be cut back. Any weight loss due to loss of fluids is immediately regained by the body after drinking.
3. Exercise in rubber suits, steam rooms, and saunas must be avoided, not only because it may be dangerous, but also because it does not lead to fat loss, and is therefore useless.
4. Any diet that concentrates on one food group and excludes one or more other food groups should be avoided for health reasons.
5. Diets that promise rapid weight loss (over 2 pounds per week) should also be avoided. A weight loss of 1-2 pounds per week is considered safe.
6. You cannot lose inches and reduce the fat content in specified spots. With increased strength, the muscle size may indeed increase, but the manner in which the body loses fat is determined by heredity and not by design.

If the energy you use is greater than the calories you eat, you will lose weight. Eating slowly and dividing the same amount of food into more meals helps avoid the feeling of hunger. Weight control becomes possible when you consider that your eyes are bigger than your stomach and that it is easy to take in more calories than you can use.

Consider the amount of running (at about 120 calories per mile) that is needed to burn off the calories in the following:

| Source of Calories | Running Required |
|---|---|
| Highball | 1.3 miles |
| Beer (12 oz) | 1.5 miles |
| Light beer (12 oz) | 1.0 mile |
| Potato chips (15) | 1.5 miles |
| Peanuts (handful) | 2.0 miles |
| Peanut butter and jelly (1 Tbsp.) | 2.5 miles |

## CHAPTER 3 : PRINCIPLES OF TRAINING

### TERMS

Some of the words used in this training program are explained below, as are some of the principles upon which this training program is based.

**PHYSICAL FITNESS** consists of the following categories: cardiovascular fitness, muscle strength, muscular endurance, and flexibility.

**Cardiovascular fitness** is a measure of heart and lung function. It is the ability to maintain whole body activity for a length of time; that is, without running out of breath. Cardiovascular fitness is developed by activity that demands a higher heart rate than normal for increasing lengths of time.

**Muscle strength** (also referred to in this Training Manual simply as "strength") is a measure of the amount of force a muscle can apply. It is developed by making a muscle apply ever-increasing forces.
**Muscular endurance** is a measure of a muscle's ability to maintain a force or repeatedly apply a force without a rest. It is developed by repeated applications of force at loads that are less than the maximum that the muscle is actually capable of applying.
**Flexibility** is a measure of the range of motion at a joint. It is developed by exercising each muscle group through its full range of motion and by training opposing muscles equally.

## TRAINING

Training consists of exercising specific muscles or muscle groups. It involves having the muscle or muscles apply and maintain a force for a short time and/or repeatedly. Calisthenics, weight training and whole body activity can be used.

The stress of training produces changes in the body that are called training effects. The body adapts to the extra demands imposed by training. The benefits are:

- Heart function and circulation are improved.
- Breathing function is improved.
- Muscle strength and muscular endurance are improved.

## OVERLOAD

Before you start to see improvement in your fitness level, the work load, or the force that the muscles apply, must make at least a minimum demand on body systems. As your body adapts to an increased load, more load must be added to continue to improve. The rate of improvement is related to the following:

- Intensity of activity (the load size).
- Frequency of activity (the number of times per week).
- Duration of training (the length of each training session).

## SPECIFICITY

The type of training must be related to the desired results or to the purpose of the training. For example, heavy weight training is of little value for cardiovascular endurance, and a lot of running is not a useful form of training for a cyclist. Performance of an activity improves when the training is applied to the same muscle groups as are used in the activity.

## USE AND DISUSE

The body needs activity and does not wear out. Lack of activity results in flabby muscles, a weak heart, poor circulation, shortness of breath, being overweight, and weakening of bones and ligaments. Regular activity results in good muscle tone, a strong heart, good circulation, endurance, a good shape, and strong bones and ligaments.

## INDIVIDUAL RESPONSE

Individuals respond differently to the same training program. The differences in response may be the result of many things, such as heredity, physical maturity, state of nutrition, habits of rest and sleep, level of fitness, personal habits such as smoking, level of motivation, the environment, and the influence of disease or injury.

## TYPES OF EXERCISES

**WARM-UP:** You should always warm up for at least 5-10 minutes before taking part in strenuous activity because it allows you to:

- Mentally prepare for exercise.
- Increase your body temperature.
- Reduce the chance of injury to muscles and joints.

Warm-up consists of a combination of calisthenics, walking, jogging, and stretching exercises. When doing stretching exercises, each exercise is performed slowly and carefully. Major joints and muscle groups are moved through the natural range of motion in a smooth manner (bobbing and jerking must be avoided).

**CALISTHENICS:** Calisthenics are exercises performed without equipment such as weights. These exercises can be used to develop strength, muscular endurance, and flexibility. However, the following exercises are to be avoided because they create too much stress in certain joints:

- Deep knee bends
- Leg raises while lying on the back
- Sit-ups with straight legs
- Toe-touches from a standing position

**DO NOT DO THESE 4 EXERCISES!**

**WEIGHT TRAINING:** Weight training consists of exercises that involve moving a weight that is external to the body. Such exercises are used to develop strength, muscular endurance, and flexibility. Special care must be taken if free weights (e.g., barbells) are used in training. They may cause injury if they fall on you. This can happen as a result of your hands slipping, or if you try to lift a weight that is too heavy for you to support. For these reasons, weight machines are safer than free weights to use in weight training.

**AEROBIC TRAINING:** Aerobic training refers to training the heart-lung or cardiovascular system. It involves strengthening the heart muscle, and improving lung capacity and the ability of the circulation system to deliver oxygen to the muscles. Training of the cardiovascular system is accomplished by continuous motion over a length of time, using large muscle groups. In other words, activities in which "wind" is a factor depend on cardiovascular conditioning. Activities such as jogging, bicycling, stair climbing, rowing, etc., are used for aerobic training.

**COOL-DOWN:** The cool-down phase is as critical as the warm-up and should last 5-10 minutes. Cooling off should consist of easy jogging, walking, light calisthenics, and stretching exercises. This phase of activity is important for the following reasons:

- It allows heart rate to decrease gradually.
- Continued activity maintains adequate circulation, prevents pooling of blood, and hastens recovery.
- It decreases the chance that cramps or other problems may follow.

## CHAPTER 4 : GENERAL DIRECTIONS FOR FITNESS PROGRAM

The fitness program is divided into the following parts:

- Warm-up and flexibility exercises
- Strength and muscular endurance exercises
- Aerobics
- Cool-down

The strength and muscular endurance exercises do not have to be done on the same day or during the same exercise session as those exercises recommended for the aerobics program. In other words, they may be done on separate days or at different times on the same day. However, you should begin every exercise session with a warm-up period and end with a cool-down period. For example, if the strength and muscular endurance exercises are done on the same day but at a different time than the aerobics program, warm-up and cool-down exercises should be done before and after each of the two exercise sessions.

The warm-up exercises are designed to get you physically and mentally ready for the muscular and/or aerobics exercise sessions. The strength and muscular endurance exercises can be done in one of two ways, depending on the availability of equipment: by calisthenics, which requires little or no equipment; or by training with weights. Training with weights can be done either by using free weights, such as barbells; or by using weight machines, such as "Universal" or "Nautilus" systems. Once you have chosen between calisthenics and weight training, you should continue with that type of training for the duration of the training period.

The aerobic exercises require no equipment. An aerobics program can and should be followed by everyone.

A weekly log sheet is provided so that you can keep track of your progress in developing strength, muscular endurance, and cardiovascular fitness. Two types of log sheets are provided: one for calisthenics and aerobics and one for weight training and aerobics. Of course, you should use the log sheet that is designed for the particular exercise program you've chosen to follow. You should make copies of the log sheet for each week of the training program.

Training for the PPT

The flexibility exercises have been selected to help develop flexibility in the major joints of the body. Flexibility will play a role in all the test events. Increased flexibility helps you move more smoothly and easily through any required motion. It also decreases the chance that injury may occur to muscles and joints.

Proper preparation for the PPT also requires the development of strength and endurance in the muscle groups that will be used for the test events. Muscle strength will be very important to those events that require a single application of force, as in lifting an object or in dragging a victim. Both muscle strength and muscular endurance will be important to those activities that involve maintaining a force or the repeated application of a force over a period of time, such as carrying equipment up stairs.

Finally, it will be necessary for you to develop cardiovascular fitness to perform those test events that involve continuous activity over an extended period of time (such as climbing stairs), as well as to last through the entire series of test events.

The rest of this Training Manual describes the exercises which can be performed to help you improve in the four categories of fitness. Chapter 5 describes the warm-up and flexibility exercises which are an essential component of any exercise program. Chapters 6 and 7 describe the calisthenics and weight training exercises that can be used to develop muscle strength and muscular endurance. Chapter 8 explains stair climbing and running workouts aimed at improving cardiovascular fitness. Finally, Chapter 9 provides cool-down exercises which, like warm-ups, are an important part of any exercise program.

Again, you know whether your physical condition puts you at the level of beginner, intermediate or advanced. The exercise programs which are presented below are useful for many people, but you should choose exercises to match your body and your state of fitness.

## CHAPTER 5: WARM-UP AND FLEXIBILITY EXERCISES

The warm-up period should last 5-10 minutes. Walking quickly and jogging are two good warm-up exercises. A good sign that you are warmed up is that you are just starting to sweat. The warm-up period increases blood flow and raises body temperature. This gets you ready for the rest of your exercises. You should warm up before each separate exercise session.

In order to reduce potential for injury during strenuous exercise, you might want to do some stretching. The exercises below are designed to increase flexibility through stretching. These should be performed before each exercise session, after you warm up.

**EXERCISE DESCRIPTIONS**
(If you have any trouble understanding or doing these exercises, please get help from a trained fitness specialist.)

1. **SEATED TOE TOUCH**
   **Stretches muscles in the back and the back of the legs.**
   Seated on the floor with your legs straight and toes pointed up, slowly slide your hands down your legs until you feel stretch. Hold the position and stretch lightly by leaning forward from the shoulders to increase the pull. Grasp your ankles and slowly pull until your head approaches your legs. Draw your toes back and slowly attempt to touch them. Repeat 5 times.

2. **SEATED TOE PULL**
   **Stretches muscles in groin and thighs.**
   Seated on the floor with your legs bent, place the soles of your feet together. Pull your toes toward your head, pressing your legs down to the side with your elbows.

3. **STRIDE STRETCH**
   **Stretches the thigh muscles.**
   Slowly slide into a stride position with your front foot almost flat on the floor, and your rear foot on your toes. Put your hands on the floor for balance. Lean forward while pushing your hips downward and hold for 5 counts. Repeat on the opposite side.

4. **WALL STRETCH**
   **Stretches the muscles in the back of the lower leg (the calf).**
   Stand about 3 feet from a wall, feet slightly apart and put both hands on the wall. With heels on the ground, keeping your body straight, lean forward slowly and feel stretch in your calves. Hold the position for 15 to 20 seconds. Repeat several times.

5. **SIDE STRETCH**
   **Exercises and stretches the muscles on the sides of the trunk.**
   With your feet shoulder-width apart, raise your right arm overhead and place your left hand on your left hip. Slowly bend to the left side, stretch gently and return to the upright position. Switch arms and do the same on the other side. Repeat 5 times on each side.

6. **SIDE TWISTER**
   **Exercises and stretches the trunk muscles.**
   With your feet comfortably apart and heels flat on the floor, bring your arms to shoulder level by your side with your arms extended and palms down. Twist your body to one side as far as possible. Repeat to the other side. Do 5 repetitions.

7. **ELBOW THRUST**

**Stretches the chest muscles and exercises the shoulder muscles.**

Standing with your feet apart, bend your arms, placing your hands in front of your chest and your elbows out to the side. Without arching your back, rhythmically thrust your elbows backwards, then return to the starting position. Repeat 15 times.

8. **ARM CIRCLES**

**Stretches the chest and shoulder muscles.**

Standing with your feet apart, make slow, full-arm circles backward 5 to 10 times, then forward the same number of times. Your arms should brush past your ears and sides.

9. **PULL-THROUGHS**

**Stretches the chest and shoulder muscles.**

Standing with your feet apart and with your body bent forward at the waist, bring one arm forward and the other arm backward to shoulder level. Swing both arms down and through so that they reverse positions. Repeat rhythmically 10 to 20 times, gradually increasing the speed of the pull-through and the height to which you swing your arms.

## CHAPTER 6: CALISTHENICS PROGRAM

Calisthenics are exercises that use body weight as the load or resistance and require little or no equipment. The following exercises were chosen for you because they increase the strength and muscular endurance in the muscle groups that will be used in the PPT. The exercise routine should be performed 3 to 4 times per week.

To begin with, most exercises should be performed as many times as possible at a continuous, steady pace, and that number repeated for each exercise during the first week. (Some exercises have a maximum, as stated in the description.) But after the first week, the number of repetitions for each exercise should be increased by at least the number shown for each exercise below. Keep a performance log (see Chapter 11). These exercises are listed in the order in which you should do them.

**EXERCISE DESCRIPTIONS**

(If you have any trouble understanding or doing these exercises, please get help from a trained fitness specialist.)

1. **PUSH-UPS**

**For the shoulder region and arm extension.**

Face down on the floor with your hands placed outside your shoulders, push up while keeping your back straight. Return until your chest almost touches the floor. Increase by at least 1 per week.

2. **CURL-UPS**

**For the upper abdominal region.**

On your back with your arms at your sides, curl your head and shoulders off the floor and look at your feet (keep your chin on your chest). Hold this position for 5 seconds and relax. Increase by at least 2 curl-ups per week.

3. **CHIN-UPS**

**For the shoulder region and arm flexion.**

With an underhand grasp, pull up until your chin is over the bar. Let down as slowly as possible. Increase by at least 1 per week.

4. LEG LIFTS

**For the muscles in the back, buttocks and the back of the legs.**

Lie face-down on the floor with a partner holding your trunk down at the shoulders. Raise both legs at the same time and then lower them to the floor. Increase the number of leg raises by at least 1 per week, up to a maximum of 15.

5. TRUNK LIFTS

**For the muscles in the back, buttocks and the back of the legs.**

Lie face-down on the floor with your fingers laced behind your head and your ankles held down by a shelf or a partner. Raise your trunk and then lower to the floor. Increase the number of raises by at least 1 per week, up to a maximum of 15.

6. SIDE LEG LIFTS

**For the back and thigh muscles.**

Lie on your side, head supported by your elbow and hand while your other hand is on the floor in front of your trunk. Lift your upper leg as high as possible and then return it to the starting position. Keep your knee straight. Continue lifting on the same side and then turn over and do the same number of lifts on the other side. Increase the number of leg lifts on each side by at least 2 per week, up to a maximum of 25 per side.

7. HALF KNEE BENDS

**For the leg muscles.**

With your feet apart and hands on your hips, squat until your thighs are parallel to the ground and then return to the standing position. You may put a 2-inch high block under your heels to aid balance. Increase the number of bends by at least 1 per week. This exercise could also be done with a weight on your back; for example, a backpack.

8. DIPS

**For muscles in the arms, shoulders, and chest.**

While sitting in a chair, grasp the sides and let your feet slide forward while supporting your weight on your arms. Lower your body toward the chair by bending your elbows to about 90 degrees and then push up to the starting position. Increase by at least 1 per week.

9. BENCH STEPS

**For the leg muscles.**

Step up onto a bench, right foot first and then bring your left foot up, and then step down again, one foot at a time, starting with your right foot. Do this as fast as possible for 30 seconds. Switch the lead foot and repeat for 30 seconds. Count the number of step-ups done with each foot. Increase the time for each lead foot by 10 seconds per week, up to a maximum of 60 seconds of stepping up and down with each lead foot.

## CHAPTER 7: SAMPLE WEIGHT TRAINING PROGRAM

The principle of weight training is overload, to achieve adaptation in a muscle or a muscle group. Following this weight training program will result in improved strength and muscular endurance in the muscle groups that will be used in the PPT. In order to understand this program, the following terms are defined:

**Load:** The number of pounds of resistance lifted or moved.

**Repetitions Maximum (RM):** The number of consecutive times the exercise is done without interruption or rest.

**Set:** One set equals the number of repetitions required of one exercise. If the recommendation is 3 sets, then 3 groups of RM are to be done in the exercise session.

The weight training exercises listed here can be performed through the combined use of free weights and weight machines, or through the use of a weight machine only. Two exercises (from the calisthenics program) that have body weight as the load instead of external weights are included in this training program to ensure that all relevant muscle groups are exercised.

The suggested beginning or initial load (IL) is given at the end of each exercise description. Three methods of determining <u>your</u> initial load are listed below:

1. If you cannot move the suggested load or cannot complete the 4 RM to start your program, reduce the suggested load by increments of 5 lbs. until you are able to complete 4 consecutive movements (the beginning RM). Record the load. This is your INITIAL LOAD (IL).

2. If, on the other hand, the suggested initial load does not appear to stress you for the beginning 4 RM, then add increments of 5 lbs. until you feel that the load represents an overload for that muscle group. Record the load. This is your initial load (IL).

3. Another way of determining the initial load is to use the maximum load you can move once in a specific exercise. Use 70% of that maximum load as the initial load for that exercise.

If you use method #3 to determine your initial load, it is extremely important that you have another person there to assist you. In fact, it is a good idea to have another person assist you in the determination of your initial load, or on the first day of training, regardless of the way you determine your initial load for each exercise.

The weight training exercises are presented in the order in which it is suggested they be performed. This program should be performed 3 times per week. Keep a log of the loads and number of repetitions, as appropriate (see Chapter 12). The suggested load increases are provided in the following table, unless stated otherwise in the Exercise Description.

**16-WEEK WEIGHT TRAINING PROGRESSION**

| Week | Load | RM | Sets |
|---|---|---|---|
| 1 | Initial Load(IL) | 4 | 3 |
| 2 | IL | 5 | 3 |
| 3 | IL | 6 | 3 |
| 4 | IL | 7 | 3 |
| 5 | IL | 8 | 3 |
| 6 | IL+ 5 lb | 4 | 3 |
| 7 | IL+ 5 lb | 5 | 3 |
| 8 | IL+ 5 lb | 6 | 3 |
| 9 | IL+ 5 lb | 7 | 3 |
| 10 | IL+ 5 lb | 8 | 3 |
| 11 | IL+ 10 lb | 4 | 3 |
| 12 | IL+ 10 lb | 5 | 3 |
| 13 | IL+ 10 lb | 6 | 3 |
| 14 | IL+ 10 lb | 7 | 3 |
| 15 | IL+ 10 Ib | 8 | 3 |
| 16 | IL+ 10 Ib | 9 | 3 |

**EXERCISE DESCRIPTIONS**

(If you have any trouble understanding or doing these exercises, please get help from a trained fitness specialist.)

1. **CURL-UPS**
   **For the upper abdominal region.**
   On your back with your arms at your sides, curl your head and shoulders off the floor and look at your feet (keep your chin on your chest). Hold for this position for 5 seconds and relax. Increase by at least 2 curl-ups per week.

2. **SQUATS**
   **For hip, knee, and trunk extensors.**
   Stand erect, with your feet shoulder-width apart, and place the bar on your shoulders behind your neck. Grip the bar with your palms forward and spread your hands far apart on the bar. Keeping your back straight and head up, lower the bar by bending your knees to about 90 degrees. Return to the starting position. Suggested initial load: 1/2 of body weight.

3. **STANDING OR OVERHEAD PRESS**
   **For muscles in the shoulders and arm extensors.**
   Stand erect, with your feet shoulder-width apart, palms forward and shoulder-width apart, with the bar touching your chest. Push the bar straight up to an overhead position until the arms are straight, and then lower it in a controlled manner to the starting position. Do not arch your back. Suggested initial load: 1/4 of body weight.

4. **HEEL LIFTS**

**For the muscles that move the feet.**

With the barbell or weight machine bar behind your shoulders and at the back of your neck (as in the squat), raise upward on your toes as high as possible and then slowly return your heels to the floor. The balls of your feet should be on a 1-2 inch high block. Suggested initial load: 1/2 of body weight.

5. **LATERAL PULL-DOWNS**

**For muscles in the shoulders and arms.**

Start from a sitting or kneeling position on the floor. Grip the bar of the weight machine with palms forward, hands more than shoulder-width apart, and elbows straight. Pull the bar down to the base of your neck and slowly return to the starting position. Suggested initial load: 1/4 of body weight.

6. **TRUNK LIFTS**

**For the muscles in the back, buttocks, and back of legs.**

Lie on your stomach, with the trunk unsupported over the edge of the trunk lift station support, and bent at the waist. With your hands locked behind your head, lift your trunk and head so that your back is parallel to the ground and then return to the starting position. Suggested initial load: the maximum number of lifts that you can perform. Increase the number of raises by at least 1 per week, up to a maximum of 15.

7. **ARM CURLS**

**For the muscles that bend the elbow.**

Standing with your arms down and elbows straight, hold the bar with an underhand grip, hands shoulder-width apart. Keeping the elbows close to your sides, bend your elbows and raise the bar to your chest, then slowly lower the bar to the starting position. Do not lean backward while raising the bar or forward when lowering it. Suggested initial load: 1/4 of body weight.

8. **BENCH PRESS**

**For muscles in the shoulder, chest, and arms.**

Lie on your back on a bench with your feet on the floor astride the bench. Hold the bar above your chest with an overhand grip, hands slightly wider than shoulder width, and elbows straight. Lower the bar to your chest and then immediately return it to the starting position. Suggested initial load: 1/4 of body weight.

9. **SIDE LEG RAISES**

**For hip and thigh muscles.**

Standing with your side to the pulley at a pulley station and holding it with one hand, hook the ankle of the outside leg to the pulley. With your knee slightly bent, move your leg to the side as far as possible, and then return to the starting position. After completing the RM, hook the ankle of the inside leg to the pulley. With your knee straight, move your leg in front of the other as far to the side as possible and complete the RM. Turn around and repeat the exercise with the opposite leg. Suggested initial load: 1/4 of body weight.

10. **TRICEPS EXTENSION**

**For arm and shoulder muscles.**

Stand with your knees straight and your feet about shoulder-width apart. With an overhand grip, hands close together, and elbows in close to the body, start with the bar of the weight machine about face level. Straighten your elbows pressing the bar down, and then return to the starting position. Suggested initial load: 1/4 of body weight.

11. <u>UPRIGHT ROWING</u>

**For shoulders, arms, and back.**

Stand erect with your feet apart. Hold the bar with an overhand grip, with your hands 1-2 inches apart at the center of the bar. Starting with the bar held at hip level, lift the bar to your chin while keeping your elbows above the bar and the bar close to your body. Return to the starting position. Suggested initial load: 1/4 of body weight.

12. <u>BENCH STEPS</u>

**For the leg muscles.**

Step up onto a bench, right foot first and then bring your left foot up, and then step down again, one foot at a time, starting with your right foot. Do this as fast as possible for 30 seconds. Switch the lead foot and repeat for 30 seconds. Count the number of step-ups done with each foot. Increase the time for each lead foot by 10 seconds per week, up to a maximum of 60 seconds of stepping up and down with each lead foot.

## CHAPTER 8: STAIR CLIMB/RUNNING PROGRAMS

For the Stairway Climb Event, you will be required to carry pieces of fire equipment up (and down) 2 flights of 15 stairs each in 6 trips. The equipment weight varies up to a maximum of 50 pounds. Your scored time will be based on the total time it takes you to take the 6 pieces of equipment up the stairs.

For the trips down the stairs you will be given a limit of 30 seconds which allows you to descend the stairs using a brisk walk. Penalty time is assessed for using more than 30 seconds for the trips down, but you will not improve your score by taking less than 30 seconds. There is no need to ever run while descending the stairs.

For this and the next three events, you will have to wear an air pack and harness weighing 22 pounds.

The stair climb program should be done 2 to 3 times per week. You should closely follow the below listed instructions to gradually build up your strength and endurance.

The running program is designed to develop cardiovascular endurance. This is needed for the PPT. The running should be done at least 3 times per week, or as indicated.

### EXERCISE DESCRIPTIONS

(If you have any trouble understanding or doing these exercises, please get help from a trained fitness specialist.)

### STAIR CLIMB PROGRAM

This event is of relatively long duration and will put demands on certain muscles and on your cardiovascular system. Fitness experts refer to this type of event as a measure of aerobic fitness, stamina, or cardiovascular endurance.

Keeping a moderate but steady pace, begin by climbing and descending two flights of stairs (for example, from the first to the third floor). As you begin your training, do not try to run at full speed; gradually increase your speed climbing the stairs. Remember that your test score will be based on how fast you can carry equipment **up** the stairs. The faster you go, the better your score will be. During the test, you will not be scored on your trips down the stairs. You must descend the two flights of 15 stairs each within 30 seconds to avoid the assessment of penalty time. It will not help your score to take less than 30 seconds for the trips down the stairs. Therefore, **there is no need, either while training or during the test, to descend the stairs at a pace faster than a brisk walk.** Repeat as many times as you can without resting and count each round trip you as you go, keeping the same steady pace.

For the first week of exercises, complete as many round trips as you did on the first day and record the amount of time you kept moving on the stairs. Increase the number of round trips by 1 per week, up to a maximum time of 10 minutes of climbing and descending the stairs. Thereafter, try to gradually increase your speed up the stairs keeping your movement under control. Remember, there is no need to ever run down the stairs. Start your first week of training without carrying any weight. As your fitness for stair climbing improves, beginning with the second week of training, start carrying 10 pounds of additional weight as you go up and down the stairs. Gradually increase the additional weight by 10 pounds per week, working up to carrying a maximum of 50 pounds. **In the actual test, you will have to carry an object weighing about 50 pounds up and down the stairs once. For the other five trips, the weight of the equipment carried will range approximately from 10 to 25 pounds. You should therefore vary the weight carried during training accordingly.** This added weight could be in the form of hand-held weights or a dumbbell in each hand. To simulate the 22 pound air pack and harness worn during this event, gradually build up to carrying 22 pounds in a back pack strapped to your shoulders. Depending on your level of initial fitness, you may elect to start training with no weight in your back pack.

## RUNNING PROGRAM

Start the program by walking, then walk and run, or run, as necessary to meet the changing time goals shown below:

| Week | Distance (miles) | Time Goal (minutes: seconds) | Times per Week |
|---|---|---|---|
| 1 | 2.0 | 32:00 | 3 |
| 2 | 2.0 | 30:30 | 3 |
| 3 | 2.0 | 27:00 | 3 |
| 4 | 2.0 | 26:00 | 3 |
| 5 | 2.0 | 25:00 | 3 |
| 6 | 2.0 | 24:30 | 3 |
| 7 | 2.0 | 24:00 | 3 |
| 8 | 2.0 | 22:00 | 3 |
| 9 | 2.0 | 21:00 | 3 |
| 10 | 2.0 | 19:00 | 3 |
| 11 | 2.0 | 18:00 | 4 |
| 12 | 2.0 | 17:00 | 4 |
| 13 | 2.5 | 22:00 | 3 |
| 14 | 2.5 | 21:30 | 4 |
| 15 | 3.0 | 27:00 | 3 |
| 16 | 3.0 | 26:30 | 4 |

## CHAPTER 9: COOL-DOWN

The cool-down session should be performed for 5 to 10 minutes at the end of each exercise period. The purpose of this phase of the program is to decrease the heart rate gradually, to continue adequate blood circulation, and to decrease the chance that problems may follow the exercise session.

After the aerobic training session, begin to jog, then walk rapidly for a total of about 5 minutes. Continue with moderate walking. Afterward, do the following stretching exercises. Their descriptions can be found under "Warm-up and Flexibility Exercises" in Chapter 5 of this Training Manual.

- Seated toe touch
- Stride stretch
- Wall stretch
- Side twister
- Arm circles

If your work-out session consisted of the strength and muscular endurance exercises only, perform the above exercises and then walk at a moderate pace for a few minutes as your cool-down session.

## CHAPTER 10: REFERENCES

The following books were used as references in the development of this fitness program.


1. American College of Sports Medicine. Guidelines for Exercise Testing. Third Edition. Philadelphia: Lea & Febiger, 1986.

2. Cooper, K. H. The Aerobics Way. New York: M. Evans Co., 1977.

3. Heyward, Vivian H. Designs for Fitness. Minneapolis: Burgess Publishing Co., 1984.

4. Howley, Edward T. & B. Don Franks. Health/Fitness Instructor's Handbook. Champaign, IL: Human Kinetics Publishers, 1986.

5. Sharkey, Brian J. Physiology of Fitness. Champaign, IL: Human Kinetics Publishers, 1979.

6. Reid, J. Gavin & John M. Thomson. Exercise Prescription for Fitness. Englewood Cliffs, NJ: Prentice Hall, Inc., 1985.

## CHAPTER 11: WEEKLY LOG - CALISTHENICS PROGRAM

Date of first day of week _____ Weight:_____

Training Week Number:_____

| NUMBER OF REPETITIONS (#) OR TIME (T) | | | | | |
|---|---|---|---|---|---|
| EXERCISE | | SESSION 1<br>DATE:<br>_____ | SESSION 2<br>DATE:<br>_____ | SESSION 3<br>DATE:<br>_____ | SESSION 4<br>DATE:<br>_____ |
| Push-ups | (#) | | | | |
| Curl-ups | (#) | | | | |
| Chin-ups | (#) | | | | |
| Leg lifts (max=15) | (#) | | | | |
| Trunk lifts | (#) | | | | |
| Side leg lifts (max=25 per side) | (#) | | | | |
| Half knee bends | (#) | | | | |
| Dips | (#) | | | | |
| Bench steps (max=60 sec) | (#)<br>(T) | | | | |
| Stair climb<br>(max=10 min.) | (#)<br>(T) | | | | |
| Running | (#)<br>(T) | | | | |

NOTE: Make additional copies of this log as needed.

## CHAPTER 12: WEEKLY LOG - WEIGHT TRAINING PROGRAM

Date of first day of week _____ Weight:_____

Training Week Number:_____

| LOAD (L), REPETITIONS (#), OR TIME (T) | | | | | |
|---|---|---|---|---|---|
| EXERCISE | | SESSION 1<br>DATE:<br>_____ | SESSION 2<br>DATE:<br>_____ | SESSION 3<br>DATE:<br>_____ | SESSION 4<br>DATE:<br>_____ |
| Curl-ups | (#) | | | | |
| Squats | (L) | | | | |
| Standing press | (L) | | | | |
| Heel lifts | (L) | | | | |
| Lateral pull-downs | (L) | | | | |
| Trunk lifts (max=15) | (#) | | | | |
| Arm curls | (L) | | | | |
| Bench press | (L) | | | | |
| Side leg raises | (L) | | | | |
| Triceps extension | (L) | | | | |
| Upright rowing | (L) | | | | |
| Bench steps (max=60 secs) | (#)<br>(T) | | | | |
| Stair climb<br>(max=10 min.) | (#)<br>(T) | | | | |
| Running | (#)<br>(T) | | | | |

NOTE: Make additional copies of this log as needed.